Companion Animal Practice: Understanding the Veterinarian's Role in Public Health, A One Health Perspective

Slide 1. Title Slide

Welcome to "Companion Animal Practice: Understanding the Veterinarian's Role in Public Health, A One Health Perspective," presented by the CDC One Health Office.

The goal of this presentation is to discuss the important role of the veterinarian in promoting public health through their work in companion animal practice in the United States. This slide set should take approximately 45 minutes to review.

Slide 2. Learning Objectives

The learning objectives for this presentation are to:

- Review zoonoses and other health risks associated with pet ownership
- Understand how general practice veterinarians contribute to public health in their daily work activities
- Develop ways to improve communication with clients regarding health risks from pets
- Identify opportunities for professional collaboration between physicians and veterinarians to further the goal of healthy pets and healthy people

Slide 3. Presentation Outline

1. Case Examples
2. Zoonoses: A One Health Perspective
3. Preventing Zoonoses in Pet Owners
4. Client Education: Selected Zoonoses
5. Opportunities for Professional Collaboration

Slide 4. Case Examples

The slides that follow will provide two examples of opportunities for client education you may encounter.

Slide 5. Case Exercise: Bats and Rabies

While you examine the teeth of a client's aging cat, he tells you a story about the bats that are living in his barn. Yesterday, he noticed one of the bats was injured unable to fly, so he's considering bringing the bat into his home to rehabilitate it.

What questions should you ask him?

What preventive messages should you share with him?

Slide 6. Rabies Case Example (continued): Rabies Prevention

Rabies is 100% preventable! The most common way for people to get rabies in the United States is through contact with a bat. All sick, dead or easily captured bats should be tested for rabies if exposure to people or pets occurs.

Advise clients not to handle or feed wild animals. Clients should keep rabies vaccinations up to date for pet dogs, cats and ferrets

For more information, visit the CDC Rabies web page: http://www.cdc.gov/rabies/index.html

Slide 7. Case Example: *Salmonella* and Backyard Poultry
A client and her young daughter are waiting in an exam room. While you administer routine vaccines to their family beagle, they mention they just started a backyard flock of chickens.

What questions should you ask them?

What preventive messages should you share with them?

Slide 8. *Salmonella* Case Example (continued): *Salmonella* from live poultry is an ongoing problem: 2012 Outbreaks of *Salmonella* Linked to Live Poultry
In 2012, there were 8 separate *Salmonella* outbreaks linked to live poultry, including chicks, ducklings and backyard poultry flocks. The median time from purchasing poultry to illness was 15 days, with a range of 3 days to 90 days. There were multiple serotypes of *Salmonella*: Thompson, Hadar, Montevideo, Infantis/Lille/Newport, Infantis, Muenchen, Braenderup

Based on preliminary data, there were 517 illnesses reported, with outbreak size ranging from 20 cases to 195 cases. Eighteen percent t(93 cases) were hospitalized, and 4 deaths occurred (it is unclear if the Salmonella infection contributed to these deaths)

Slide 9. *Salmonella* Case Example (continued): Highlights from 2012 Outbreak Data (as of July 1, 2013)
This slide presents trends in recent outbreaks linked to backyard poultry. Over 70% of cases (ill people) reported contact with baby poultry (chicks, ducklings, goslings). The common reasons for purchasing poultry are meat, eggs, to keep the poultry as a pet and other reasons, including youth projects.

In recent outbreaks, approximately 1/3 of ill people kept poultry inside their home, approximately 1/3 of ill people reported snuggling with poultry and approximately 10% reported kissing poultry
2013: Multiple outbreaks with 100s of illnesses linked to backyard flocks. Current updates are available at www.cdc.gov/zoonotic/gi

Slide 10. *Salmonella* Case Example (continued): *Salmonella* infections can be prevented!
Advise clients to wash their hands with soap and water immediately after handling live poultry, or materials in their habitat. Advise clients that children should not kiss poultry or put their hands or other objects into their mouths after handling animals. Habitats and their contents should be carefully cleaned outdoors, if possible.

Do not let live poultry inside the house, in bathrooms or especially in areas where food or drink is prepared, served or stored, such as kitchens or outdoor patios.

For more information, visit the CDC Enteric Zoonoses web page: http://www.cdc.gov/zoonotic/gi/

Slide 11. Zoonoses: A One Health Perspective

The slides that follow will give an introduction to zoonotic infectious diseases.

Slide 12. What is One Health?

The One Health concept recognizes that the health of humans, animals, and the environment are interconnected. Global collaboration between public health, human medicine, ecology, and veterinary medicine is necessary for effective detection, control, and prevention of public health threats.

Some pathogens, known as zoonotic diseases, can be transmitted from animals to humans. Examples of zoonotic diseases include rabies, salmonellosis, and Ebola. Animals also share our susceptibility to certain diseases and environmental hazards and can serve as early warning for potential human infections. For example, deaths in birds infected with West Nile Virus often occur before human cases of West Nile Virus fever.

The concept of One Health is not new, but its importance has been recognized in recent years. Demographic and ecological changes have altered the interactions of humans with the environment and caused the emergence and reemergence of diseases. As human populations grow and expand, more people are living in close contact with wild and domestic animals. Climate change and land use changes, such as deforestation and intensive agricultural practices, have altered the balance between pathogens and their animal hosts. Increases in international travel and trade allow pathogens to be rapidly transported across the globe. These factors demonstrate the importance of using an integrated approach to public health that reflects the interconnectedness of the larger ecological system.

Successful public health interventions require the cooperation of the human, veterinary, and environmental health communities. By promoting this collaboration, CDC achieves optimal health outcomes for both people and animals.

Slide 13. What is a Zoonotic Disease?

Many definitions exist and commonalities can be drawn between them:

"Any disease or infection that is naturally transmissible from vertebrate animals to humans. Animals thus play an essential role in maintaining zoonotic infections in nature…"

- World Health Organization

Animal diseases that are transmissible to humans."

- World Organization for Animal Health

"Any infectious disease that can be transmitted (in some instances, by a vector) from non-human animals, both wild and domestic, to humans or from humans to non-human animals."

- Wikipedia

Slide 14. Why are zoonotic diseases important?

Of all human pathogens, 60% are zoonotic. [1-4] Approximately 75% of all recent emerging infectious diseases of human concern are of animal origin. [1-4]

There are approximately 1.1 million domestically acquired *Salmonella* infections annually in USA. Eleven percent of these infections are caused by direct animal contact[5]

References
Hale, C. R., E. Scallan, A. B. Cronquist, J. Dunn, K. Smith, T. Robinson, S. Lathrop, M. Tobin-D'Angelo and P. Clogher (2012). "Estimates of enteric illness attributable to contact with animals and their environments in the United States." Clin Infect Dis **54 Suppl 5: S472-479.**
Jones, K. E., N. G. Patel, M. A. Levy, A. Storeygard, D. Balk, J. L. Gittleman and P. Daszak (2008). "Global trends in emerging infectious diseases." Nature 451(7181): 990-993.
Taylor, L. H., S. M. Latham and M. E. Woolhouse (2001). "Risk factors for human disease emergence." Philos Trans R Soc Lond B Biol Sci 356(1411): 983-989.
Woolhouse, M. and E. Gaunt (2007). "Ecological origins of novel human pathogens." Crit Rev Microbiol 33(4): 231-242.
Woolhouse, M. E. and S. Gowtage-Sequeria (2005). "Host range and emerging and reemerging pathogens." Emerg Infect Dis 11(12): 1842-1847.

Slide 15. Modes of Transmission

There are several ways zoonotic diseases can be transmitted between humans and animals. Three general categories for transmission include:

1. Foodborne: Consumption of animal products (meat, milk, eggs)
2. Direct contact: Direct transmission can occur when a person comes in contact with an animal's contaminated body (fur, feathers, scales), or is bitten or scratched by an infected animal.
3. Indirect contact: occurs when a person comes in contact with cross-contaminated food or with a contaminated animal's environment or habitat.
4. Vector-borne: occurs when a person is bitten by an infected vector (ticks, mosquitoes, lice, fleas or other disease carrying insects)

It is important to note that many animals infected with a zoonotic disease do not show clinical signs of the infection. Zoonoses that can cause severe illness in people, often do not cause clinical illness in pets. For example, domestic cats infected with *Toxoplasma gondii* generally only show mild clinical signs when they are first infected, or may be completely asymptomatic. Reptiles and Amphibians carrying and shedding *Salmonella* also do not present with clinical illness. The safety precautions discussed in this presentation should be used when interacting with all animals, even if they appear healthy.

Slide 16. People do not have to touch a pet to catch a zoonotic disease

The aquarium displayed in the picture on the right has been placed on the kitchen counter next to baby bottles, the kitchen sink, bottle brushes and baby formula. If this aquarium houses a frog, there is the potential for the aquarium, and its contents to be contaminated with *Salmonella*. This sets up an opportunity for contamination of baby bottles with *Salmonella* if they come in contact with the aquarium or the surfaces where the aquarium was cleaned. Food can also become contaminated if the counter and sink are not properly disinfected after cleaning the aquarium and before preparing food on these same surfaces.

Slide 17. Preventing Zoonoses in Pet Owners

The following slides will provide an overview of zoonoses to consider in pet owners and general prevention messages

Slide 18. Pet Ownership in the United States

Pets play an important role in the lives of many Americans. Almost 63% of pet-owning Americans consider their pets "part of the family." Approximately 39% of households own at least one dog and 33% own at least one cat. Approximately 1.6 million households own a reptile. This is good news, as multiple health benefits of pet ownership have been documented: Pets have been shown to improve their owners' mobility as well as cardiovascular health. They provide companionship, emotional support, and can improve the lives of Americans with disabilities. In regards to children, owning pets can teach responsibility and compassion, and has been associated with a decreased risk of allergic disease later in life.

References:
Websites
Humane Society of the United States:
http://www.humanesociety.org/issues/pet_overpopulation/facts/pet_ownership_statistics.html
American Veterinary Medical Association. 2012. U.S. Pet Ownership and Demographics Sourcebook:
https://www.avma.org/KB/Resources/Statistics/Pages/Market-research-statistics-US-Pet-Ownership-Demographics-Sourcebook.aspx

Publications:
American Pet Products Association, I. (2012). 2011-2012 APPA National Pet Owners Survey
Arhant-Sudhir K et al. 2011. Pet ownership and cardiovascular risk reduction: supporting evidence, conflicting data and underlying mechanisms. Clin Exp Pharmacol Physiol. 2011 Nov; 38(11):734-8
Gretebeck KA et al. 2012. Dog Ownership, Functional Ability, and Walking in Community Dwelling Older Adults. J Phys Act Health. 2012 Oct 4; epub ahead of print
Oryszczyn MP et al. 2003. Allergy markers in adults in relation to timing of pet exposure: the EGEA study. Allergy. 2003 Nov;58(11):1136-43
Rintala DH et al. 2008. Effects of assistance dogs on persons with mobility or hearing impairments: A pilot study. J Rehab Research Develop. 2008; 45(4):489-504

Slide 19. Selected Zoonoses

These are selected zoonoses that can be associated with companion animals.

The CDC website "Healthy pets, Healthy People" provides all of this information in one easy location:
http://www.cdc.gov/healthypets/

Slide 20. Other Health Risks

Not all risks from pets are infectious in nature: Pets can cause injuries from biting and scratching, or people in the household may be allergic to pets.

Injuries – Trauma

- Approximately 50% of dog bites involve an animal owned by the victim's family or neighbors.
- Children are the most common victims of these bites, especially in the case of fatal encounters between dogs and people.

Allergies

- Approximately 10% of people with allergies are allergic to pets and up to 20% of those with asthma are allergic to pets

References:

Websites:
http://www.aaaai.org/Aaaai/media/MediaLibrary/PDF%20Documents/Libraries/EL-allergies-pets-patient.pdf

Publications:
Presutti RJ. 2001. Prevention and treatment of dog bites. American Family Physician. 63(8):1567-1573
Reisner IR and Shofer FS. 2008. Effects of gender and parental status on knowledge and attitudes of dog owners regarding dog aggression towards children. JAVMA. 233:1412-1419.

Slide 21: Daily Activities for Zoonotic Disease Prevention

Veterinarians can help mitigate health risks of pet ownership and support the human-animal bond through their daily activities in general practice:

Routine Veterinary Care

- Vaccinations
- Routine treatment for intestinal parasites
- Flea/tick preventatives

Client education

- Discuss zoonoses and other health risks
- Teach animal handling skills for children (bite prevention)
- Guide appropriate pet selection
- Counsel immuno-compromised clients on how to safely care for their animals

Slide 22. Routine Veterinary Care: Healthy Pets = Healthier People

Vaccines are administered to pets to prevent diseases that cause significant morbidity and mortality. It is important to remind owners that the vaccines given for rabies and leptospirosis are also known zoonoses. When discussing the importance of these vaccines for pets, be sure to include information on how these diseases are transmitted from animals to people and the steps pet-owners can take to reduce their risk of infection.

Routine deworming and external parasite prevention for pets are an important part of veterinary practice. When discussing the benefits of monthly preventatives with clients, remind clients of the benefits to their entire family: Prevention of cutaneous and visceral larval migrans and a decrease in disease carrying vectors within their home.

Slide 23. General Prevention Messages

Veterinarians can consistently take small opportunities during clinic visits to educate clients on avoiding injury and illness:

- Wash hands with soap and water immediately after handling pets, pet foods, or materials in the pet's habitat. Running water and soap are best. Use hand sanitizers if running water and soap

are not available. Be sure to wash your hands with soap and water as soon as a sink is available. Adults should always supervise hand washing for young children
- Don't let pets lick people on the mouth
- Work with puppies and kittens to encourage gentle play habits
- Fence pets to reduce contact with stray/wild animals

Slide 24. Identify High-Risk Clients

Be aware of the people that live in your client's household. While the client who typically brings the pet to the office may be healthy and at low risk for diseases, clients or people that live in the home may have an especially high-risk for infection. For example, older household members (over 64 years), children less than 5 years old, pregnant women and individuals with chronic illness who are immunocompromised can all be more susceptible to infection. The general messages listed on slide 11 are excellent for all households, however, if you become aware that there may be high-risk clients living in the home, be sure to include additional information on the risk of zoonotic disease transmission and how clients can minimize these risks.

For more information on High-risk Clients visit: http://www.cdc.gov/healthypets/extra_risk.htm

Slide 25. Client Education: Selected Zoonoses

The next few slides will discuss some of the more common zoonoses that veterinarians should be able to discuss with their clients.

Slide 26. Rabies

All species of mammals are susceptible to rabies virus infection, but only a few species are important as reservoirs for the disease. In the United States, distinct strains of rabies virus have been identified in raccoons, skunks, foxes, and coyotes. Several species of insectivorous bats are also reservoirs for strains of the rabies virus.

Transmission of rabies virus usually begins when infected saliva of a host is passed to an uninfected animal. The most common mode of rabies virus transmission is through the bite and virus-containing saliva of an infected host. Though transmission has been rarely documented via other routes such as contamination of mucous membranes (i.e., eyes, nose, mouth), aerosol transmission, and corneal and organ transplantations.

It's important to remind clients that rabies is a medical urgency but not an emergency. Decisions should not be delayed. One of the most effective ways to decrease the chance for infection is to wash the wound thoroughly with soap and water. Clients should see their physician for treatment of trauma due to the bite wound, and to decide if postexposure prophylaxis (PEP) is required. The decision to administer PEP will be based on the type of exposure and the animal the person was exposed to, as well as laboratory and surveillance information for the geographic area where the exposure occurred.

For more information visit: http://www.cdc.gov/rabies/

Slide 27. Rabies

Key Client Recommendations:

- Keep your pets healthy
  - Keep vaccinations up to date for pet dogs, cats and ferrets.
  - Keep pets under your direct supervision so they do not come in contact with wild animals
  - Call your local animal control agency to remove stray animals from your neighborhood
- Avoid direct contact with unfamiliar animals
  - Do not handle or feed wild animals
  - Never bring wild animals into your home
  - Teach children never to handle unfamiliar animals
  - Prevent bats from entering living quarters

Slide 28. Rabies

Key Client Recommendations:

- If bitten by an animal, clients should:
  - Immediately wash bite wounds with soap and water
  - Seek medical evaluation for any animal bite
- A healthy domestic dog, cat, or ferret that bites a person should be confined and observed for 10 days. Any illness in the animal should be evaluated by a veterinarian and reported immediately to the local public health department
- Skunks, raccoons, foxes and bats that bite humans should be euthanized and tested as soon as possible

If a bat is found in the room with a sleeping person, unattended child, mentally disabled person or intoxicated person, the bat should be trapped and submitted for rabies testing

Slide 29. *Toxoplasma gondii*

Cats and Toxoplasmosis: Cats acquire *Toxoplasma gondii* when they consume infected rodents, birds, or other small animals. Newly infected cats are most likely to shed oocysts in their feces for 1-2 weeks. This time period often goes unnoticed as the majority of cats will not show clinical signs.

Transmission to humans: *T. gondii* oocysts become infectious 1-5 days after they are passed in feces. People become infected when they ingest *T. gondii* cysts in undercooked meat, or when they accidentally ingest infectious oocysts from a cat's litterbox.

Generally if a woman has been infected before becoming pregnant, the unborn child will be protected because the mother has developed immunity. If a woman is pregnant and becomes newly infected with *Toxoplasma* during or just before pregnancy, she can pass the infection to her unborn baby (congenital transmission). The damage to the unborn child is often more severe the earlier in pregnancy the transmission occurs. Potential results can be severe neurologic problems in the child, and fetal death.

Important Note: Cats are the only animals that will shed oocysts in their feces, however humans can also become infected by consuming raw or undercooked meat that is contaminated (similar to how cats get the disease from eating prey animals).

Slide 30. *Toxoplasma* Transmission

The only known definitive hosts for *Toxoplasma gondii* are members of family Felidae (domestic cats and their relatives). Unsporulated oocysts are shed in the cat's feces . Although oocysts are usually only shed for 1-2 weeks, large numbers may be shed. Oocysts take 1-5 days to sporulate in the environment and become infective. Intermediate hosts in nature (including birds and rodents) become infected after ingesting soil, water or plant material contaminated with oocysts . Oocysts transform into tachyzoites shortly after ingestion. These tachyzoites localize in neural and muscle tissue and develop into tissue cyst bradyzoites . Cats become infected after consuming intermediate hosts harboring tissue cysts . Cats may also become infected directly by ingestion of sporulated oocysts. Animals bred for human consumption and wild game may also become infected with tissue cysts after ingestion of sporulated oocysts in the environment . Humans can become infected by any of several routes:

- Eating undercooked meat of animals harboring tissue cysts .
- Consuming food or water contaminated with cat feces or by contaminated environmental samples (such as fecal-contaminated soil or changing the litter box of a pet cat) .
- Blood transfusion or organ transplantation .
- Transplacentally from mother to fetus .

In the human host, the parasites form tissue cysts, most commonly in skeletal muscle, myocardium, brain, and eyes; these cysts may remain throughout the life of the host. Diagnosis is usually achieved by serology, although tissue cysts may be observed in stained biopsy specimens . Diagnosis of congenital infections can be achieved by detecting *T. gondii* DNA in amniotic fluid using molecular methods such as PCR .

Slide 31. *Toxoplasma gondii:* Key Client Recommendations

It is important that pregnant cat owners do not feel pressured to relinquish their cats; however there are some important steps they should take to protect themselves:

- Consider keeping cats indoors to prevent hunting
- Do not feed raw meat diets
- Do not adopt a new kitten or cat if anyone in the house is pregnant
- Litter boxes should be cleaned by someone else in the household: If not possible, clean 1-2 times a day, wear gloves and wash hands immediately afterwards
- If cats are long-haired, keep hair on tail and around back of legs trimmed to prevent fecal matter accumulation
- Cats like to defecate in garden areas: Wash garden vegetables well and wear gloves when gardening

Slide 32. *Bartonella henselae* (Cat Scratch Disease)

B. henselae in Cats: The bacteria are naturally transmitted among cats by cat fleas (*Ctenocephalides felis*) and 40% of cats are infected at some time in their lives. Naturally infected cats are primarily asymptomatic, subclinical carriers of *Bartonella henselae*. *B. henselae* infections in cats, also known as feline bartonellosis, may occasionally cause a self-limiting, transient, febrile illness that lasts for

approximately 48-72 hours. Clinical symptoms of more serious infection, although rare, include fever, vomiting, lethargy, red eyes, swollen lymph nodes, and/or decreased appetite. Bacteremia can persist for months with clinical signs appearing when the cat is under stress (surgery or trauma) or concurrent with another disease. Cats < 1 year of age are most likely to be infected.

Transmission to Humans: This bacteria can be transmitted from a cat to a person during a scratch. Although anyone can become infected, immuno-compromised individuals are at greater risk. Symptoms include fever, a pustule or papule at the inoculation site and enlarged, tender lymph nodes.
For more information, visit: http://www.cdc.gov/bartonella/

Slide 33. *Bartonella henselae* (Cat Scratch Disease)

Veterinarians may be asked by clients if they should test their cat for *Bartonella*. Testing a cat is possible, but it is important to know that positive serology does not indicate a current infection, and a negative blood culture or PCR does not necessarily mean the cat is not a carrier. At this time, there is no known benefit to culture or routine serologic testing for cats.

However, there are recommendations you can make to immuno-compromised clients who wish to adopt a new cat:

- Adopt a visibly healthy cat > 1 year of age; preferably one with known history of consistent flea prevention
- Apply flea prevention monthly (even for indoor only cats)
- Avoid rough play with cats
- Wash all cat-associated wounds promptly
- Do not allow cats to lick wounds or cuts

Slide 34. *Salmonella* from Poultry, Reptiles, Amphibians

Poultry in backyard flocks, reptiles, amphibians, and rodents commonly carry *Salmonella.*

In recent years, there have been a number of large, high-profile outbreaks of *Salmonella enterica* infections in humans associated with pets and pet products, including small turtles, and African dwarf frogs. Salmonella bacteria are normal gut flora for most or all reptiles and amphibians. Humans become infected when they come into contact with fecal matter from a colonized reptile, and multiple studies have shown that direct contact is not necessary to acquire Salmonella infection. Compared to other reptiles, turtles are considered especially risky for young children. This is because turtles are more likely than other reptiles to be given to young children due to their slowness, gentle nature and their perceived ease of care. In contrast to other reptiles, turtles are frequently kept in a terrarium with a reservoir of water, which can amplify Salmonella bacteria, and which may serve as a source of infection among young children who handle the turtle or come in contact with its habitat.

Backyard poultry are becoming more common, even in urban areas. In 2012, there was a salmonella outbreak among 195 people in 27 states. Most had contact with live chickens, and many had purchased chicks from mail-order hatcheries.

Although poultry, reptile and amphibians are not the typical patients seen at a veterinary practice, asking if these animals are present in the home can provide the opportunity to educated clients on the risks for Salmonellosis from these animals.

Slide 35. *Salmonella:* Key Client Recommendations

Key recommendations and prevention messages:

- Keep live poultry, amphibians, and reptiles out of homes and facilities with high risk people
- Clean and disinfect any surfaces that have been in contact with animals
    - Children should perform this task only under adult supervision.
- Habitats and their contents should be carefully cleaned outdoors, if possible
    - Do not dispose of water in sinks used for food preparation or for obtaining drinking water
    - To prevent cross-contamination, avoid washing pet food and water dishes in the kitchen sink or bathtub
    - If bathtubs must be used for these purposes, they should be thoroughly cleaned and disinfected with bleach afterward

Slide 36. *Salmonella* in Pet Food

Pet food is not manufactured to be a sterile product. Pet foods and treats have contents of animal origin and are at risk for *Salmonella* contamination. There are several reported outbreaks of Salmonellosis in humans from pet food products. Dogs and cats can also become infected and shed *Salmonella* in feces and saliva for extended periods of time; however they may not show clinical signs. Additionally, CDC recommends against feeding raw food to dogs and cats because of the risk of illness in the pet and the people in the household.

Diagnosis: If you are presented with an ill animal suspected to have come in contact with recalled products or with clinical signs consistent with salmonellosis, please report the case to FDA. For testing, the American Association of Veterinary Laboratory Diagnosticians (AAVLD) and the American Veterinary Medical Association (AVMA) recommend submitting diarrhea (preferred) or vomitus samples to a state or university veterinary diagnostic laboratory for *Salmonella* culturing and pulsed-field gel electrophoresis testing (PFGE). Additionally, stool samples can also be submitted for pets that appear healthy but were known to eat a recalled product. If the laboratory isolates *Salmonella* but cannot perform PFGE, the isolate maybe forwarded to a laboratory that can perform the procedure such as one of the American Association of Veterinary Laboratory Diagnosticians (AAVLD) labs in your area or the Diagnostic Bacteriology Laboratory at the National Veterinary Services Laboratories (NVSL) in Ames, Iowa. To locate an AAVLD laboratory in your area, go to *AAVLD Accredited Labs*, or go to the *AAVLD's home page* and click on the "Accreditation" link on the left side menu bar. To submit isolates to NVSL, complete Form VS 10-3 indicating whether serotyping, PFGE, or both are requested. Form VS 10-3 and additional information on sample submission is located at *the NVSL website*.

If you think a patient has become ill as a result of consuming a pet food product, visit the FDA pet food reporting page: http://www.fda.gov/AnimalVeterinary/SafetyHealth/ReportaProblem/ucm182403.htm

Slide 37. *Salmonella* in Pet Food: Client Recommendations
Key recommendations and prevention messages:

- Purchase packaged food with no visible signs of damage to the package
- Avoid cross-contamination of human food and environments with pet food by:
    - Feeding pets in areas other than the kitchen
    - Washing hands immediately after handling pet food and treats
    - Avoiding use of kitchen sink and bathtub when washing pet food and water bowls
- Keep children 5 years and younger away from areas where pets are fed to help prevent illness and injury

Slide 38. Children and Pets
Due to the risks of Salmonella, children should avoid contact with reptiles, amphibians, baby chicks, and ducklings. Recommend against these pets for households with children under five years of age. Additionally, let clients know that children should stay away from pets with diarrhea.

Slide 39. Recommendations for Parents of Infants and Young Children
Specific risks from animal contact: Children's immune systems are still developing and may not protect from infection as well as that of a healthy adult. Children are also especially likely to have interactions with pets that place them at elevated risk. They are predisposed to bites, scratches and licks to the face and hands due to their height and curiosity about animals. Children can also have very intimate interactions with animals, including kissing, licking and sharing beds, and may not take adequate hygienic measures, such as frequent hand and face washing after handling pets. Children are more likely to put contaminated objects or hands in their mouth, which can result in disease exposure. Finally, children may not be fully reliable reporters of exposures and symptoms when physicians are obtaining a medical history, which can present diagnostic challenges for identifying zoonotic diseases early in the clinical course.

Key recommendations and prevention messages:

- Ensure children wash their hands thoroughly after all animal interactions
- Teach kind handling of animals and understanding of animal body language
- Do not allow children to kiss pets or to put their hands or other objects into their mouths after handling animals
- Puppies and kittens < 6 months are more likely have intestinal parasites- discuss importance of routine deworming
- Wash hands prior to breast feeding or preparation of formula
- Clean animal cages, tanks etc. outside to prevent cross-contamination in the kitchen
- Children should be supervised at petting zoos to make the experience fun and safe!

Slide 40. Opportunities for Professional Collaboration
The next few slides will provide a suggestions of how to contribute to public health, and how to collaborate with physicians.

Slide 41: The Veterinarian's Role in Professional Collaboration

- Be aware of the zoonotic disease potential of your diagnosis

    - Veterinarians should attempt to stay up-to-date concerning the zoonotic potential of common diagnoses and keep brochures or print outs from reliable websites to provide to clients that explain the human disease risks associated with specific diagnoses.

- Be aware of high-risk client needs or concerns
    - Ask if clients if they have any concern about their pets, or if their physician has expressed any concerns

- Encourage consultation with physicians for follow-up
    - For infections that are highly communicable to humans, veterinarians should encourage clients to consult their physician to determine if additional testing or preventive measures should be prescribed. You can help your human medical counter-parts with this referral process by providing copies of diagnostic result and discharge forms, along with a business card for clients to give to their doctors. Tell clients that you are available to consult with their doctor should they have questions about the diagnosis.

Slide 42: Direct Communication with Physicians

Veterinarians can also open direct lines of communication with physicians, and this may be warranted when pets are diagnosed with a very serious condition with high risk to humans living with the ill animal. You should request permission from the client to contact their doctor to provide details of the pet's medical history and diagnosis. This permission should ideally be written and should document that you discussed with the client the information you plan to discuss and the person or persons you will be engaging in these discussions. Inform clients that they can revoke this permission at any time and document these discussions with clients and the outcomes of these discussions in the patient record.

Reference:
Babcock et al. 2008. Legal implications of zoonoses for clinical veterinarians. JAVMA 233(10):1556-62.

Slide 43. Summary

In summary, pets are important part of the family dynamic, and there are many benefits to pet ownership. There are diseases that pets may carry that can make people sick, and this can occur even when pets appear healthy. It is important for veterinarians to recommend and discuss the benefits of preventive veterinary care for pets and personal protection measures that will help clients keep themselves and their families safe. By discussing disease and injury prevention strategies with clients, veterinarians help mitigate the risks of pet ownership. By fostering professional relationships with physicians, veterinarians can help to close the potential gaps that exist with zoonotic disease prevention.

Slide 44. For more information please contact the Centers for Disease Control and Prevention using the contact information provided on this slide.